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CLAIMS

1. Product, which is at least partly transparent and of optical quality equivalent to that of a window, characterized in that it comprises a plastic core coated with a skin comprising at least one plastic film supporting a scratch-resistant layer.
2. Product according to Claim 1, characterized in that the thickness of the skin is at most equal to 500  $\mu\text{m}$ , preferably between 10 and 100  $\mu\text{m}$ , and in that the skin consists of one or more transparent thermoformable plastic films, especially made of polycarbonate, polypropylene, poly(methyl methacrylate) an ethylene/vinyl acetate copolymer, poly(ethylene terephthalate), polyurethane, polyvinyl butyral or a cycloolefin copolymer, between which is interposed, or on which is deposited, at least one functional layer, it being possible moreover for at least one of these films itself to constitute one such functional layer.
3. Product according to Claim 1 or 2, characterized in that the thickness of the scratch-resistant layer is between 1 and 10  $\mu\text{m}$  and in that this scratch-resistant layer is essentially inorganic, especially consisting of polysiloxanes and/or based on silica and/or on alumina, or essentially consists of networks of entangled inorganic and organic molecular chains linked to each other by means of silicon-carbon bonds.
4. Product according to Claim 3, characterized in that the external surface of the skin is hydrophobic/oleophobic and in that the external layer of which the skin is composed contains a hydrophobic/oleophobic agent, especially of the fluorinated polysilane type, the said external layer consisting of the said scratch-resistant layer in which the said hydrophobic/oleophobic agent is incorporated, or of a thin layer, having a thickness of between 2 and 50 nm, essentially consisting of the said hydrophobic/oleophobic agent, such a thin layer being obtained by

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grafting, or else of a layer of the said hydrophobic/oleophobic agent, this layer being supported on a film of the poly(vinyl fluoride) or poly(vinylidene fluoride) type.

5 5. Product according to one of Claims 1 to 4,  
characterized in that the said skin includes at least  
one decorative and/or masking layer covering all or  
part of the surface of the product, this layer being  
preferably positioned directly under the film  
10 supporting the scratch-resistant layer.

6. Product according to one of Claims 1 to 5, characterized in that the said skin includes at least one adhesion layer constituting, in particular, the internal surface of the skin intended to come directly into contact with the core of the product.

7. Product according to one of Claims 1 to 6, characterized in that the said skin includes one or more optically selective layers, for example thin metal layers, especially based on silver, having thicknesses of between 2 and 35 nm and separated from each other, as well as from other adjacent layers or films, by dielectric layers.

8. Product according to one of Claims 1 to 7, characterized in that the said core consists of a thermoplastic such as polycarbonate, poly(methylmethacrylate), an ethylene/vinyl acetate copolymer, poly(ethylene terephthalate), polyurethane or a cycloolefin copolymer, or of an ionomer resin or of a thermosetting or thermally crosslinkable material of the polyurethane, unsaturated polyester, ethylene/vinyl acetate copolymer type, or else of a combination of several thicknesses of the same one or several of these plastics, given that the core thus formed is chemically compatible with the said skin and is capable of giving the assembly the required mechanical properties.

9. Product according to one of the preceding claims, characterized in that it is bent and in that it

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forms a motor-vehicle window having, in particular, the regulation optical properties.

10. Product according to one of the preceding claims, characterized in that the scratch-resistant layer finally has a surface appearance without any crazing.

11. Process for manufacturing a product according to one of Claims 1 to 10, which consists:

• firstly, in assembling the constituent elements of a skin by laying them approximately flat, or by supplying them from a device of developable shape, especially by screen printing, flexography, ink-jet printing, laser printing, dip coating or spraying, these being optionally combined with vacuum deposition techniques of the sputtering or evaporation type, and, where appropriate, in subjecting the constituent elements of the skin to an operation whose purpose is to consolidate them to a greater or lesser extent, then,

• secondly, in subjecting the skin to a heat treatment, preferably at a temperature of between 100 and 300°C, the skin being supported completely or partly by a mould surface, an auxiliary means for shaping at least part of the skin to the said mould surface, especially by blowing or by suction, being optionally provided so as to relax the stresses in the skin, and in crosslinking certain constituent elements thereof and

• thirdly, in joining the skin to a plastic core by hot pressing in a form, or by thermoplastic injection moulding or reactive injection moulding of the material of the core, the skin having been positioned in the bottom of the mould in such a way that its constituent scratch-resistant layer and/or hydrophobic/oleophobic layer is in direct contact with the mould.

12. Process for manufacturing a product according to one of Claims 1 to 10, comprising the steps:

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• of depositing the constituent elements of a scratch-resistant layer on a substantially flat plastic film and

• of shaping this film bearing the elements of the scratch-resistant layer into a shape which is the same as or at least similar to the ultimate shape of the end-product, at least in certain parts, while at the same time at least partly crosslinking this scratch-resistant layer.

10 13. Process according to Claim 12, characterized in that the crosslinking and simultaneous shaping involve a heat treatment at a temperature of between 100 and 300°C, and more precisely between 140 and 240°C.

15 14. Process according to either of Claims 12 and 13, characterized in that the shaping is carried out by supporting the film coated with the scratch-resistant layer, or the elements intended to constitute this layer, at least on part of its surface, by a mould.

20 15. Process according to Claim 14, characterized in that the mould carrying the film is a frame open at its centre.

25 16. Process according to one of Claims 11 to 15, characterized in that the film coated with the scratch-resistant layer or elements constituting this layer is combined, before shaping, with one or more other films which themselves fulfil functions or carry means, such as screen-printed decorations or layers, carrying out these functions other than the scratch-resistance function.

30 17. Application of a product according to one of Claims 1 to 10 as a body element, a transparent part of which forms a window, especially for motor vehicles.

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